

Demonstration 1 - Dimensional Instruments

ME3023 - Measurements in Mechanical Systems

Mechanical Engineering

Tennessee Technological University

Topic 2 - Using A Micrometer

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- Overview
- Components
- Vernier Micrometer
- Digital Micrometer

Overview

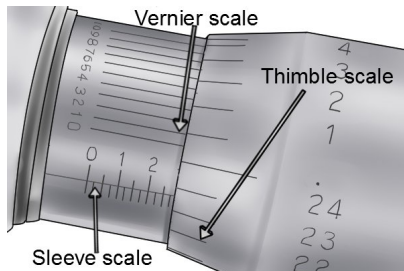
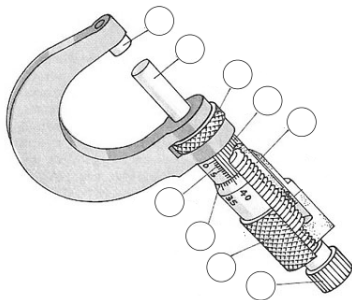
A micrometer, sometimes known as a micrometer screw gauge, is a device incorporating a calibrated screw widely used for accurate measurement of components[1] in mechanical engineering and machining as well as most mechanical trades, along with other metrological instruments such as dial, vernier, and digital calipers.

Text: Wikipedia

Unlike a pair of Vernier or digital calipers, most micrometers are designed to measure outside dimensions only.

Text: Theory and Design of Mechanical Measurements, 5th Edition

Components



- ❶ Anvil
- ❷ Spindle
- ❸ Thimble
- ❹ Lock Ring

- ❺ Sleeve Scale
- ❻ Thimble Scale
- ❼ Vernier Scale
- ❽ Ratchet (Clutch) Knob

Vernier Micrometer

A vernier scale is a visual aid to take an accurate measurement reading between two graduation markings on a linear scale by using mechanical interpolation; thereby increasing resolution and reducing measurement uncertainty by using Vernier acuity to reduce human estimation error. [Wikipedia](#)

Pros

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Cons

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Vernier Micrometer

Look at scale carefully and clean the jaws before you take a measurement. First look at the main scale then add the measurement from the Vernier scale.

Digital Micrometer

A digital micrometer contains an embedded processor and user interface to facilitate the measurement process.

Pros

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Cons

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Digital Micrometer

Make sure to clean the jaws and zero the instrument before you take a measurement. Also, be careful not to press the zero button on accident. On some models this is very easy to do.